career to his younger colleagues and even the students themselves. His successor on observing this will be a different type of man than he is himself. His students are not learning from his example and daily association what he learned from his predecessors of a past academic generation. Even the best student advances less quickly, and the great majority of students in the overflowing classes and laboratories are severely handicapped by the infrequency of personal contact with a skillful and mature scientist. The occasional genius will unaided recognize the crucial experiment or theoretical development by himself. But even he will have difficulty in selecting and employing the most appropriate technique and arriving at a significant and convincing conclusion without the guidance of an experienced investigator. The students who persevere are perforce learning self-reliance but the educational system is not serving them well.

The number of students receiving degrees is impressive but the quality of training has suffered. This tendency toward a dilution of the profession will react upon its standards and its standing. Much pure research of high quality is now being conducted in industrial and government laboratories where excellent salaries and congenial working conditions are attracting many of the ablest young men. Our academic institutions can take great satisfaction in having contributed to the bringing about of this situation. But now comparably attractive opportunities must be provided in colleges and universities on a scale that will ensure an instructional staff of the highest quality and adequate in size for the job to be done. Unless this is brought about, the trend toward dilution and mediocrity will increase with inevitable repercussions on the scientific profession. The quality of the scientific manpower they employ is the measure of the potential of our industrial and defense laboratories. A second or third-rate scientist were better off in some other occupation. The quality of the nation's scientists and the significance of the programs upon which they are engaged are dependent upon the maintenance of the highest standards of educational performance by our colleges and universities. We must do more to strengthen our scientific training than we are at present and to bring about those conditions which will attract an adequate number of the most competent scientists and most inspiring investigators into academic employment.

G. P. Harnwell

NOTES AND COMMENTS

Zucker's Article Protested

Most of the opinions expressed by A. Zucker in his article "A Physicist's Holiday" (*Physics Today*, January, 1951) seem to me and to most of my Italian colleagues very personal, and anyhow very different from ours. I do not wish to enter into all details, as that would need an article as long as his, which does not seem to me to be worth while. But the point which I feel obliged to answer is the opinion attributed to Italian physicists with regard to the constitution of a European laboratory. Such a proposal, put forward by the American delegation at the 1950 UNESCO assembly in Florence, was received with very great interest, I should almost say enthusiasm, by the great majority of Italian physicists, who in all meetings whether national or international held for this purpose have always been extremely desirous to contribute actively to the construction and the functioning of such an organization. No anxiety exists among Italian physicists, but on the contrary a lively desire to collaborate in this field of scientific activity, as in every other field, with their colleagues and friends of other countries, and in particular with the French, who on their part are not less interested and desirous to collaborate with us.

Other opinions of Mr. Zucker, such as the incapacity of Italian and French physicists to collaborate in "team work," are lacking in common sense and lead one to suspect that the author has never read the titles of the works published in these countries by physicists associated in most cases in large groups. Some of Mr. Zucker's opinions seem to be due to his slight understanding of other languages and mentalities. For instance, in his reference to the opinion of Prof. Bolla, Mr. Zucker has confused the crowd of secondary and high school teachers with the physicists destined to do research. I do not think it is the case to discuss whether Italian physicists are "disgusting" or not. It is true that almost all Italian professors, including Prof. Bolla and myself, believe that much better physicists could be produced than we produce today, and we hope to succeed in this effort in the near future, but we do not think that those we produce now are so bad, at least if we compare them with those of other countries.

I hope that Mr. Zucker will soon be able to come to France and Italy (or to other European countries) and to remain and work for some time. I am sure, really sure, that all here will learn and appreciate his sureness and unbiased judgement, and he on his side will be able to realize that aside from matters of an external nature the physicists of these countries have as much interest in scientific research as do physicists of the U.S.A. and certainly not narrower views, in so far as concerns the relation among groups of scientists from politically different countries; and that they are always ready to find a good opportunity to have a drink, be it Coca-Cola, Cognac, or Frascati wine.

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